بسم الله الرحمن الرحيم

عنوان المحاضرة: **Puberty**

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-1st sign of Pubertal development is usually breast development (Thelarche), followed by appearance of pubic hair (Pubarche), then (Axillary hair) then (Menarche)

-The mean interval between breast budding & menarche is 2.5 years with a standard deviation of about one year

-Negros age of menarche may be only 7 years! –The more the weight of girl, the less the age of menarche

Adrenarche:

-Normally occurs between 6 – 8 years -Increased levels of androgens

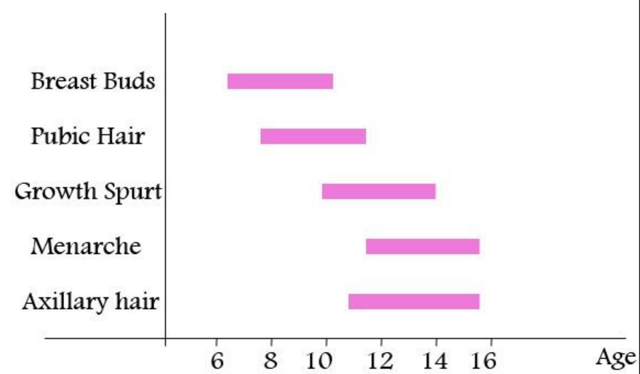
-Appears as: -Appearance of Sexual hair (Pubic and Axillary) -Increase of the height (8 cm)

Gonadarche:

-Since birth the small amount of Estrogen released from the ovary is enough to suppress higher centers till the start of puberty when sensitivity of the higher centers (hypothalamus & pituitary) to estrogen decreases so that: - The hypothalamus starts to secrete gonadotropin-releasing hormone (GnRH) → A pulsatile pattern that regulates the release of FSH & LH by anterior pituitary → Ovaries

Breast development only at early age (e.g. 5 yrs) doesn't mean precocious puberty as it might be d.t. estrogen producing tumors (<u>Most of them are Malignant</u>)**

- أكبر مشكلة في الـprecocious puberty هو زيادة الـEstrogen اللي هتؤدي لـprecocious closure of epiphysis وبالتالي تؤدي إلى قصر القامة بشكل واضح



- There are classifications of Puberty as:

Tanner 5 Stages Classification: that depends on development of 1- Genitals 2- Breast 3- Pubic hair

Evaluation of Abnormal Puberty:

1- History 2- Direct Physical Examination 3-Growth Chart

4- Radiograph of Lt Wrist to establish Bone Age

Causes of Premature Puberty:

a) Central: 1- Hypothalamic tumor (producing GnRH) 2- McCune-Albright syndrome

b) Peripheral: 1- Ovarian tumors 2- Adrenal tumors 3- Congenital Adrenal hyperplasia

Causes of Delayed Puberty:

1- Pituitary (e.g. Hypopituitarism) 2- Gonadal (e.g. Turner Syndrome – Klienfelter Syndrome)

Turner Syndrome: -Diagnosis: Chromosomal Analysis (45, X) –TTT: Reassurance, Hormone replacement Patient has a Short Stature (absent X → Long cell cycle → slow cell division)

Diagnosis of Precocious Puberty: (GnRH Stimulation Test)

Technique: 1- Administer 100 ug GnRH IV or SC 2- Obtain Serum FSH & LH Levels at 15, 30, 45, 60 min

Result: Two or Three fold Rise in FSH and LH in the case of True Precocious puberty

While in Normal or False precocius puberty only one fold

** GnRH is used in preparation of IVF: at first it cause Stimulation induction but with continuous administration it causes Pituitary Desensitization → inhibition of ovarian follicular growth → So when administering exogenous gonadotropins to → induce superovulation.

**In Benign premature thelarche, Breast Biospy is FORBIDDEN as It is = Partial Mastectomy

McCune-Albright syndrome: (RARE)
Classic Triad: 1-Polyosteotic Fibrous dysplasia 2-Café-au-Lait spots 3-Precocoius puberty

Medical Treatment of Precious puberty:
GnRH Analogue (Lupron) → Desensitization of Anterior pituitary

** Constitutional delay of puberty: child is healthy but has a slower rate of physical development than average. Their height is appropriate for bone age. They follow the same percentile throughout their growth.

Primary Amenorrhea:
-Absence of secondary sexual characteristics by age 14 with no menarche <u>or</u>
Normal secondary sexual characteristics but no menarche by 16 years of age.